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| 10/783,748 | 02/20/2004 | Alexandros T. Demos | 008514/DSM/BCVD/JW | 7358 |

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EXAMINER

NGUYEN, KHIEM D

ART UNIT PAPER NUMBER

2823

DATE MAILED: 09/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/783,748

Applicant(s)

DEMOS ET AL.

Examiner

Khiem D. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION***New Grounds of Rejection******Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

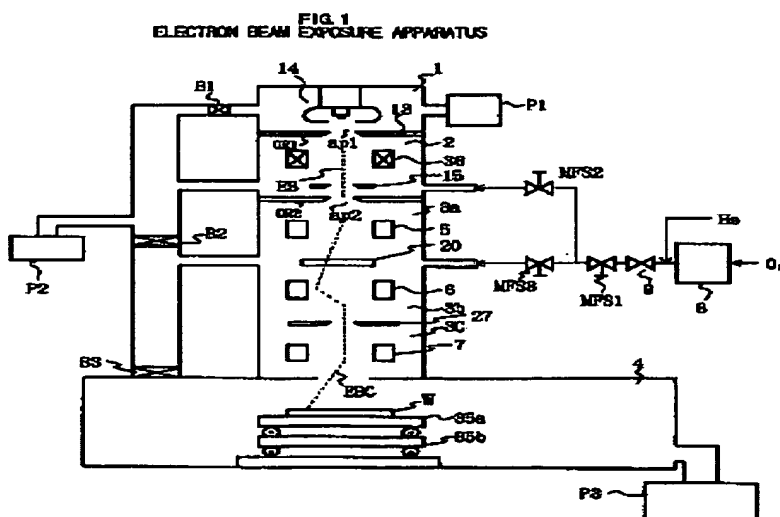
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 5, 8-10 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Ooaeh et al. (U.S. Patent 5,981,960).

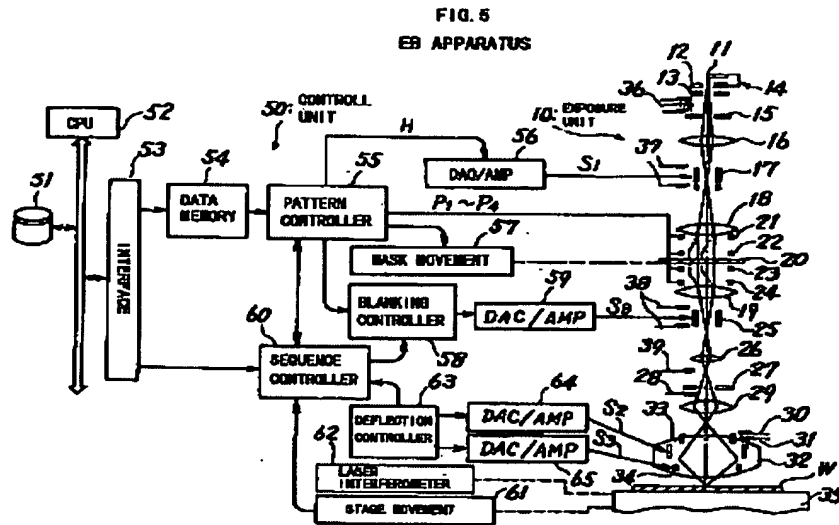
In re claim 1, **Ooaeh** discloses a method of cleaning a chamber of an electron beam treatment apparatus, the method comprising:

generating an electron beam current EB through a cleaning gas to energize (col. 5, lines 8-19) the cleaning gas (oxygen-based gas (ozone)) in the chamber of the electron beam treatment apparatus 1 (col. 4, lines 35-59 and FIG. 1);



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monitoring an electron beam current EB (col. 8, lines 10-22 and FIG. 5);



adjusting a pressure of the cleaning gas (oxygen-based gas (ozone)) to maintain the electron beam current at a substantially constant value (col. 4, lines 51-66); and stopping the flow of cleaning gas when the cleaning gas pressure becomes substantially constant for a predetermined length of time (col. 5, lines 8-19).

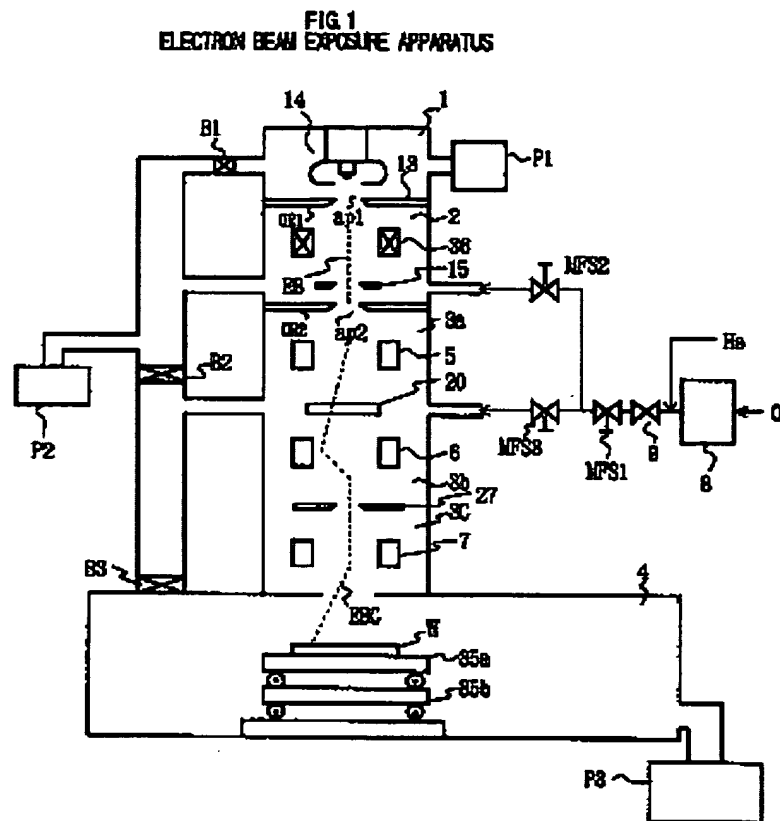
In re claim 4, as applied to claim 1 above, Ooach discloses all claimed limitations including the limitation wherein the cleaning gas comprises an oxygen-based gas (col. 5, lines 8-19).

In re claim 5, as applied to claim 4 above, Ooach discloses all claimed limitations including the limitation wherein the oxygen-based gas comprises one or more of O₂ and ozone (col. 5, lines 8-19).

In re claim 8, Ooach discloses a method of cleaning an electron beam treatment chamber, the method comprising: generating an electron beam current EB through a

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cleaning gas (oxygen-based gas (ozone)) to energize (col. 5, lines 8-19) the cleaning gas in the electron beam treatment chamber 1 (col. 4, lines 35-59 and FIG. 1); and



stopping the flow of cleaning gas after the cleaning gas pressure becomes substantially constant for a predetermined length of time (col. 5, lines 8-19).

In re claim 9, as applied to claim 8 above, Ooach discloses all claimed limitations including the limitation wherein the cleaning gas comprises an oxygen-based gas (col. 5, lines 8-19).

In re claim 10, as applied to claim 9 above, Ooach discloses all claimed limitations including the limitation wherein the oxygen-based gas comprises one or more of O₂ and ozone (col. 5, lines 8-19).

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In re claims 13, 14, and 15, as applied to claim 8, 9, and 11 above, Ooach discloses all claimed limitations including the limitation wherein a gas pressure of about 1 Torr or greater is maintained in the chamber (col. 4, lines 60-66).

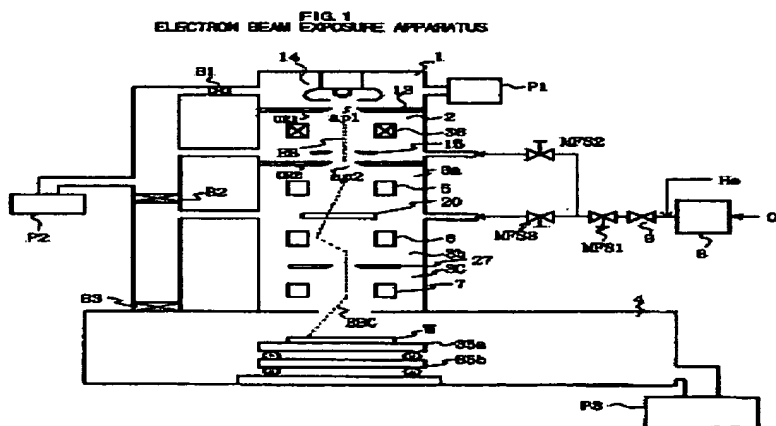
Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 16-18 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooach et al. (U.S. Patent 5,981,960).

In re claim 16, Ooach discloses a method of cleaning a chamber of an electron beam treatment apparatus, the method comprising: introducing a cleaning gas (oxygen-based gas (ozone)) into the chamber 1 (col. 4, lines 35-59 and FIG. 1);



generating an electron beam current EB through the cleaning gas to energize the cleaning gas in the chamber 1 (col. 5, lines 8-19);

setting in the chamber, an electron beam current; adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value (col. 4, lines 51-66); and determining an endpoint of the cleaning process and stopping introduction of the cleaning gas when the cleaning gas pressure reaches a substantially constant value (col. 5, lines 8-19).

Ooaeh discloses setting in the chamber, an electron beam current EB (col. 4, lines 35-59) and determining an endpoint of the cleaning process and stopping introduction of the cleaning gas when the cleaning gas pressure reaches a substantially constant value (col. 4, lines 51-66) but does not explicitly disclose that the electron beam current is about 1 mA and maintains the value for a length of time of 5 seconds.

However, there is no evidence indicating the electron beam current and the time duration is critical and it has been held that it is not inventive to discover the optimum or workable electron beam current range and the length of time of a result-effective variable within given prior art conditions by routine experimentation. See MPEP § 2144.05.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

In re claim 17, as applied to claim 16 above, Ooaeh discloses all claimed limitations including the limitation wherein the cleaning gas comprises an oxygen-based gas (col. 5, lines 8-19).

In re claim 18, as applied to claim 17 above, Ooaeh discloses all claimed limitations including the limitation wherein the oxygen-based gas comprises one or more of O₂ and ozone (col. 5, lines 8-19).

In re claims 21, 22 and 23, Ooaeh does not explicitly disclose stopping the flow of cleaning gas when the cleaning gas pressure becomes substantially constant for a length of time of 5 seconds and an electron beam current of about 10 mA or above.

However, there is no evidence indicating the time duration and the electron beam current range is critical and it has been held that it is not inventive to discover the optimum or workable length of time and electron beam current range of a result-effective variable within given prior art conditions by routine experimentation. See MPEP § 2144.05.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

5. Claims 6, 7, 11, 12, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooaeh et al. (U.S. Patent 5,981,960) in view of Ohtoshi et al. (U.S. Patent 5,539,211).

In re claims 6, 7, 11, 12, 19 and 20 as applied to claims 1, 8, and 16 Paragraphs 3 and 4 above, Ooaeh discloses all the claimed limitations including an oxygen-based gas comprises one or more of O₂, ozone, NO, and H₂O (col. 12, lines 10-16 and col. 12, lines

59-65) but does not explicitly disclose or suggest that the cleaning gas comprises a fluorine-based gas comprises one or more of NF_3 , F_2 , CF_4 , C_2F_6 , C_3F_8 and SF_6 .

Ohtoshi, however, discloses an electron beam exposure apparatus having a cleaning function (col. 11, lines 50-60) including a cleaning gas comprises a fluorine-based gas (col. 12, lines 10-16 and col. 12, lines 59-65) wherein the fluorine-based gas comprises CF_4 (col. 12, lines 10-16 and col. 12, lines 59-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Ooaeh and Ohtoshi to enable the process of providing a cleaning gas comprises a fluorine-based gas such as CF_4 of Ooaeh to be performed and furthermore to obtain a charged beam apparatus having a function of cleaning and a method of cleaning the apparatus (col. 1, lines 11-13, Ohtoshi).

Response to Applicants' Amendment and Arguments

6. Applicant's arguments with respect to claims 1 and 4-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D. Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:30 AM - 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K.N.
September 09, 2006

Brook Kebede
BROOK KEBEDE
PRIMARY EXAMINER